

**Claims**

1. A fine-tuning assembly for an optical grating provided in an optical fiber, said assembly comprising:
  - 5           a hollow structure for mounting the optical fiber under tension therethrough along a longitudinal direction;
  - 10          a sliding member slideable within said hollow structure along said longitudinal direction, said sliding member having a slanted passage extending therethrough at an angle with a transversal direction, the sliding member and hollow structure respectively having a first and a second anchor point for affixing the optical fiber thereto with the optical grating extending between said first and second anchor points;
  - 15          a wedge member slideable within said slanted passage without interfering with said optical fiber; and
  - 20          transversal displacement means for transversally displacing said wedge member, thereby longitudinally sliding the sliding member within the hollow structure for finely adjusting the tension in the optical fiber and fine-tuning the optical grating.
- 25         2. The fine-tuning assembly according to claim 1, wherein the first anchor point is adapted to receive an extremity of the optical fiber.
- 30         3. The fine-tuning assembly according to claim 2, wherein said transversal displacement means comprise:
  - 25          a screw;
  - 30          a screw hole provided in the hollow structure for mounting the screw therethrough rotatably about the transversal direction while preventing movement of said screw in the longitudinal and transversal directions; and
  - 35          a transversal threaded cavity provided in the wedge member for threadedly receiving said screw.

4. The fine-tuning assembly according to claim 2, wherein said transversal displacement means comprise:

first and second screws;

5 opposed first and second screw holes provided in the hollow structure transversally allowing the respective first and second screws therethrough while preventing movement of said first and second screws in the longitudinal direction; and

10 opposed first and second transversal threaded cavities provided in the wedge member for respectively and threadedly receiving said first and second screws.

5. The fine-tuning assembly according to claim 1, wherein said sliding member has a longitudinal bore for allowing the optical fiber therethrough.

15 6. The fine-tuning assembly according to claim 5, wherein said transversal displacement means comprise:

a screw;

20 a screw hole provided in the hollow structure for mounting the screw therethrough rotatably about the transversal direction while preventing movement of said screw in the longitudinal and transversal directions; and

25 a transversal threaded cavity provided in the wedge member for threadedly receiving said screw.

7. The fine-tuning assembly according to claim 5, wherein the wedge member has a hollow portion therein for allowing the optical fiber therethrough.

8. The fine-tuning assembly according to claim 7, wherein said transversal displacement means comprise:

first and second screws;

30 opposed first and second screw holes provided in the hollow structure transversally allowing the respective first and second screws therethrough while

preventing movement of said first and second screws in the longitudinal direction; and

opposed first and second transversal threaded cavities provided in the wedge member for respectively and threadedly receiving said first and second screws.

- 5        9. The fine-tuning assembly according to claim 1, wherein the angle of the slanted passage with the transversal direction is smaller than 5 degrees.
- 10      10. The fine-tuning assembly according to claim 1, further comprising bonding means for bonding the optical fiber to the sliding member and hollow structure at said first and second anchor points.
- 15      11. The fine-tuning assembly according to claim 10, wherein said bonding means include an epoxy glue.
12. A fine-tunable optical grating assembly, comprising:  
a hollow structure having a longitudinal direction and a transversal direction normal thereto;
- 20      an optical fiber having an optical grating therein and longitudinally mounted under tension in the hollow structure;
- 25      a sliding member inserted into said hollow structure and slideable therein along said longitudinal direction, the sliding member having a slanted passage extending therethrough at an angle with the transversal direction, the optical fiber being affixed to first and second anchor points respectively provided on the sliding member and hollow structure with the optical grating extending between said first and second anchor points;
- 30      a wedge member slideable within said slanted passage without interfering with said optical fiber; and  
transversal displacement means for transversally displacing said wedge member, thereby longitudinally sliding the sliding member within the hollow

structure for finely adjusting the tension in the optical fiber and fine-tuning the optical grating.

13. The fine-tunable optical grating assembly according to claim 12, wherein an  
5 extremity of the optical fiber is affixed to the first anchor point.

14. The fine-tunable optical grating assembly according to claim 13, wherein said  
transversal displacement means comprise:

a screw;

10 a screw hole provided in the hollow structure, the screw extending therethrough and being rotatable about the transversal direction,, said screw hole preventing movement of said screw in the longitudinal and transversal directions; and

15 a transversal threaded cavity provided in the wedge member threadedly receiving said screw.

15. The fine-tuning assembly according to claim 13, wherein said transversal displacement means comprise:

first and second screws;

20 opposed first and second screw holes provided in the hollow structure transversally receiving the respective first and second screws therethrough while preventing movement of said first and second screws in the longitudinal direction; and

25 opposed first and second transversal threaded cavities provided in the wedge member respectively and threadedly receiving said first and second screws.

16. The fine-tuning assembly according to claim 12, wherein said sliding member has a longitudinal bore allowing the optical fiber therethrough.

17. The fine-tuning assembly according to claim 16, wherein said transversal displacement means comprise:

a screw;

5 a screw hole provided in the hollow structure transversally, the screw extending therethrough and being rotatable about the transversal direction said screw hole preventing movement of said screw in the longitudinal and transversal directions; and

a transversal threaded cavity provided in the wedge member threadedly receiving said screw.

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18. The fine-tuning assembly according to claim 16, wherein the wedge member has a hollow portion therein allowing the optical fiber therethrough.

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19. The fine-tuning assembly according to claim 18, wherein said transversal displacement means comprise:

first and second screws;

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opposed first and second screw holes provided in the hollow structure transversally receiving the respective first and second screws therethrough while preventing movement of said first and second screws in the longitudinal direction; and

opposed first and second transversal threaded cavities provided in the wedge member respectively and threadedly receiving said first and second screws.

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20. The fine-tuning assembly according to claim 12, wherein the angle of the slanted passage with the transversal direction is smaller than 5 degrees.

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21. The fine-tuning assembly according to claim 12, further comprising bonding means for bonding the optical fiber to the sliding member and hollow structure at said first and second anchor points.

22. The fine-tuning assembly according to claim 21, wherein said bonding means include an epoxy glue.

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